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THE CONTINUING SCIENTIFIC CONTROVERSY

The report of the Tobacco Advertising Inquiry refers to evidence purportedly underlining the "connection between smoking and certain diseases." Consideration of the available facts, however, shows that the connection referred to is primarily epidemiological or statistical. Since statistics alone can never establish a causal relationship between smoking and disease, scientific research is needed to investigate the associations which have been identified. Equally important is the need to confront the data which do not support the smoking-disease theory but which evidence an existing scientific controversy. The following brief discussion will demonstrate some of the facts involved in this controversy.

LUNG CANCER

Examination of lung cancer data reveals the numerous weaknesses in relying upon statistical evidence. Initially, it should be remembered that most smokers do not develop lung cancer whereas many non-smokers do. Further, significant differences between smokers and non-smokers are overlooked by comparison of groups solely on the basis of smoking habits. Lung cancer mortality data are generally drawn from death certificates (a recognized inaccurate source) and are subject to various claims of misdiagnosis.[1] Dahlgren, for instance, has noted the use of inadequate techniques to distinguish between primary cancer of the lung and tumors which have metastasized (spread) from another site.[2] Large variations have been demonstrated in the lung cancer rates reported from different countries. For example, cigarette consumption in Finland is only slightly higher than that of Sweden,[3] yet the incidence of lung cancer in Finland is nearly four times as high.[4] Finally, much of the lung cancer data do not take into consideration the influence of genetics nor the etiologic roles of environmental and occupational exposures. The importance of such factors is demonstrated by studies finding that lung cancer mortality among migrant populations falls between the rates of the country of origin and the new host country.[5-9]

Experiments on laboratory animals have failed to support the hypothesis that exposure to fresh tobacco smoke causes lung cancer. Not only have these experiments employed unrealistic exposure levels, the procedures are not representative of and can have no relevance to the human experience.

A most interesting development regarding the relationship of smoking to lung cancer has recently occurred in the United Kingdom. Professor Phillip Burch, a medical physicist, reviewed the available data on lung cancer and has concluded that there is strong evidence that lung cancer is

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caused by "spontaneous cell mutations" and not cigarette smoking. [14] Professor Burch's demonstration of statistical inconsistencies and his utilization of the constitutional hypothesis have ignited considerable debate on the smoking and health relationship.

HEART DISEASE

Epidemiological studies on coronary heart disease (CHD) have failed to demonstrate a consistent relationship with smoking. An international study by Keys found that in Finland, the Netherlands, Yugoslavia, Italy, Greece, and Japan, there was "little or no" relationship between cigarette smoking and CHD.[11] In a somewhat analogous study, Hjermann investigated "risk factors in the development of CHD for males in Oslo, Norway.[12] Data showed that hereditary predisposition, obesity, physical inactivit hyperlipidemia, and hypertension, all qualified as independent risk factors; cigarette smoking did not. Most recently, Seltzer examined Doll's data on British physicians and found, among other things, that British doctors had a reported 8% rise in CHD mortality during the time that the proportion of cigarette smokers among the doctors fell approximately 50%.[13,14]

Similarly, recent studies implicate factors other than smoking as important in the causation of coronary heart disease. Life style and genetics appear significant to the development of CHD. In fact, the overt behavior pattern (Type A) was found to be prominent among major "risk factors" in a recent prospective study.[15]

In another study, Punsar, et al., examined two Finnish male cohorts for evidence that drinking water quality affects the development of CHD.[16] Low concentrations of chromium and copper in the drinking water of areas with high CHD suggested that there may be a water agent responsible for the difference of coronary mortality between the two cohorts.

Gyntelberg examined Danish men to determine the effects of alleged coronary heart disease "risk factors" such as physical inactivity, smoking, alcohol use, body weight and height, and medical history of physical fitness.[17] A "rather unexpected" finding was that smokers in the study were slightly more "physically fit" than the total group of non-smokers and equally as fit as subjects who had never smoked.[18] Moreover, the prevailing factors in the least physically fit males were high blood pressure and signs of phychological stress.

THE IMPORTANCE OF TWIN STUDIES

As noted earlier, epidemiological studies which collect data only on a subject's smoking habits and the incidence of disease or mortality fail to account for the incomparability of smokers and non-smokers with regard to genetically determined qualities such as physique, personality and social and ethnic characteristics. In an attempt to correct this shortcoming, researchers at the Karolinska Institute have utilized the Swedish

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Twin Registry to control for the influence of genetics. The findings of these studies have case considerable doubt on the smoking-disease hypothesis. For example, among "identical" twins of differing smoking habits, no excess mortality associated with smoking was found.[19,20] These findings are consistent with later studies involving CHD in twins.[21,22] Nevertheless, some scientists have questioned the twin studies because the data do not support the more traditional view of smoking causation. The original authors, Cederlof, et al., have responded to these questions in recent issues of Lakartidningen.[23-27] In explaining their results and methods, the researchers have again demonstrated the importance of the constitutional hypothesis and the need for unbiased, scientific effort in the area of smoking and health.

A recent study by Cederlof, et al., underscores the proper analysis of statistics when genetic factors are not considered.[28] In a probability sample of 55,000 Swedish subjects, the researchers examined the relationship of smoking and some social co-variables to total mortality and morbidity. Although the smoking was identified as a "risk factor" for certain diseases, the authors explained the obvious limitation which must be placed upon such data:

> "In an overall evaluation of the results it should first of all be pointed out that the emphasis of the study has not been upon assessing to what extent the statistical associations found point to a causal relationship between smoking and mortality. No attempt has thus been made to take up this matter here." [29]

The associations found simply point out the important roles played by social covariables in the development of disease. For example, the unprecedented finding of excess risk for cancer of the cervix among female smokers demonstrates the need for further studies which consider the compounding effects of social covariables and general differences between smokers and non-smokers.

WHY DO PEOPLE SMOKE?

Almost without exception, publications and discussions about smoking are concerned with the possible harmful effects connected with the practice. Nobel prize winner, Dr. Ulf von Euler, described the imbalance when he recently spoke to the Medical Experts Commission of the Swedish tobacco monopoly:

> "In my opinion, insufficient attention has so far been paid by scientists to the beneficial effects of smoking, while, strangely enough, its adverse effects on human health are being talked about all the time." [30]

Similarly, Dr. Hans Selye, world renowned pioneer of stress research, noticed the absence of any discussion of smoking benefits as he testified before the Canadian Parliament:

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". . .if smoking would only represent a risk, it would not have come up for consideration by this Committee because no one would smoke if he derived no satisfaction from it." [31]

Research into the benefits of smoking should not be avoided because of preconceived beliefs on the part of some scientists. As pointed out by the U. S. Terry Report: "Medical perspective requires recognition of the significant beneficial effects of smoking."[32]

THE NEED FOR RESEARCH

The Tobacco Advertising Inquiry has stated in its Report that "no further doubt" exists about the dangers of tobacco. In contrast, this brief comment has presented some of the material which evidences a legitimate and continuing scientific controversy. Those reports which accept and repeat controversial claims as fact do a disservice to the research that is presently being performed by diligent scientists. The answers to the unresolved questions which remain can only be obtained through objective scientific research and the industry is firmly committed to the support of these efforts.

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